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Test Anxiety, Depression, and Irrational Beliefs in College Students

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Abstract

This study examined the relationship between test anxiety, depression, and four of Ellis's (1963) irrational beliefs (demand for approval, anxious overconcern, helplessness, and frustration reactivity). Participants completed questionnaires examining test anxiety, depressive symptoms, and irrational beliefs. It was expected that the first three beliefs would be predictive of students' test anxiety scores. Students with high test anxiety and high depressive symptoms were also expected to score high on frustration reactivity, in contrast to low scores found among high test-anxious, low-depressive students. Demand for approval and anxious overconcern were found to be significant predictors of level of test anxiety. However, no significant differences were found between the high-depression and low-depression groups for the belief of frustration reactivity.

Test Anxiety, Depression, and Irrational Beliefs in College Students

Psychological theories on the development of mood and anxiety disorders have progressed over more than a century, beginning with Freud's psychoanalytic theory, and moving more recently towards behavioral and cognitive-behavioral models to explain these prevalent disorders. Over 28% of U.S. citizens will experience a form of anxiety disorder during the course of their lifetimes, and 16.6% will experience major depressive disorder (Kessler, Berglund, Demler, Jin, Merikangas, & Walters, 2005). College students are at risk for a number of mental disorders, including anxiety disorders, which are estimated to affect over 15% of undergraduate students (Eisenberg, Gollust, Golberstein, & Hefner, 2007). In particular, test anxiety is prevalent on college campuses (Spielberger et al., 1976); some studies show that as much as 15-20% of college students struggle with test anxiety (Driscoll, Holt, & Hunter, 2005; Zeidner, 1998). Another common disorder is that of depression; in 2006, 15% of college students reported having been diagnosed with depression (American College Health Association, 2006). Several cognitive theories have been developed in order to explain the etiology and maintenance of these disorders; these theories focus primarily on negative cognitions, worry, and emotionality. In the growth of test anxiety as a construct, it is important to further explore the relationship between test anxiety, depression, and these irrational beliefs.

General anxiety has been a topic of interest for centuries, pre-dating psychology as a separate science and, some might argue, extending as far back as rational thought. The idea of fear is often a theme found in ancient Egyptian hieroglyphs, and the medieval philosopher Ala ibn Hazn made anxiety a central theme of many of his works (Spielberger, 1972). In more recent years, anxiety has become a fundamental problem, and a major theme of research in the field of psychology.

One main distinction in the area of general anxiety that has been the topic of much research is the concept of state versus trait anxiety. Trait-state anxiety theory was first posited in 1966 by Spielberger, who differentiated between anxiety as an emotion and anxiety as a personality trait. State anxiety is one that is experienced in a situation subjectively perceived as dangerous or risky, and is accompanied by autonomic nervous system activation, as well as feelings of nervousness. Trait anxiety, on the other hand, would be found in a person who is disposed to find a wide variety of situations to be anxiety-producing, to a greater extent than a person without trait anxiety, who would only experience state anxiety (Spielberger, 1966).

Test anxiety

Test anxiety has long been considered a situation-specific facet of trait anxiety, beginning with Spielberger, Anton, and Bedell (1976). They argued that, as a trait, test anxiety reflects "individual differences in the tendency to perceive evaluative situations as threatening" (p. 323). To further clarify, a person might experience state anxiety during a particularly difficult test; however, a person with trait test anxiety would experience anxiety during all tests, independent of the difficulty level, or his or her knowledge of the subject. Test anxiety, referred to in earlier years as "examination stress" or "evaluation anxiety," is a type of trait anxiety, which occurs in situations involving performance evaluation. In research, the term "test anxiety" is not limited to situations involving traditional forms of tests, such as paper examinations; it can refer to situations where the evaluation is related to task performance, for example. Test anxiety can even be limited to the type of test; for example, students with a specific type of test anxiety may feel anxious only during math-related exams (math anxiety is often considered a separate construct).

Although some research was done on evaluation stress as early as 1914 (Zeidner, 1998), test anxiety did not enter the field of psychology as a separate construct until the 1950s. At the time, test anxiety was researched primarily in a behavioral context; researchers focused mainly on relating anxiety, which they believed indicated drive and motivation, to performance and learning (Mandler & Sarason, 1952). As well, the behavioral perspective brought about early operational self-report measures of test anxiety, later expanding the construct to involve a cognitive facet (Zeidner, 1998).

In the 1960s, Spielberger was a major test anxiety researcher, who first distinguished test anxiety as a situation-specific type of trait anxiety (Spielberger et al., 1976). As well, two components of test anxiety were determined: facilitating and debilitating anxiety. Facilitating test anxiety leads to task-related responses and behaviors, whereas debilitating anxiety leads to task-irrelevant behaviors (Alpert & Haber, 1960). There was a final conceptual development in test anxiety research that brought about the distinction between worry and emotionality, as researchers shifted towards cognitive orientations (Liebert & Morris, 1967). In this development, worry was described as a cognitive component of test anxiety, involving "cognitive concern about the consequences of failing" (p. 975), whereas emotionality was designated as an affective component, reflecting the uncertainty of one's success in a testing situation (Liebert & Morris, 1967).

Beginning in 1970, research began to take on another topic: the influence of test anxiety on academic performance. This movement was primarily begun by Wine (1971), whose cognitive-attentional (or interference) model attempted to account for test anxiety's impact on performance (Zeidner, 1998). Wine (1971) built upon Alpert and Haber's (1960) debilitating versus facilitating anxiety and posited that a high test-anxious person would divide his or her

time doing both task-related behaviors and task-irrelevant behaviors, including ruminating over choices and worrying about his or her performance relative to others', whereas a low test-anxious participant would use only task-related behaviors (Wine, 1971). By the end of the 1970s, however, a second position emerged, and researchers began to investigate the concept of study-skills deficits as related to test anxiety and performance, in contrast to a cognitive-behavioral etiology (Zeidner, 1998).

According to Zeidner (1998), who wrote a historical overview of the evolution of test anxiety research, test anxiety research experienced a peak in research popularity in the 1980s, and was conducted around the globe. Literature appeared in many of the most prestigious psychological journals, and some of the first volumes on test anxiety began to be published. During this time, test anxiety research focused mainly on testing theoretical models, such as self-control and attributional self-expectancy, as information-processing models. As well, research focused on treatment and alleviation of test anxiety (Zeidner, 1998).

Since its peak in the 1980s, research production on test anxiety has slowed somewhat, focusing primarily on the development of new scales, new methods of analyzing data, and the inclusion of cultural effects on test anxiety (Zeidner, 1998). However, test anxiety is still an important research topic; it has been shown to affect a surprising number of college students. Because of its prevalence, its development as a construct is still salient.

Irrational Beliefs and Test Anxiety

As researchers in the field of psychology shifted towards a more cognitive-based viewpoint, Albert Ellis was a forerunner in advancing the cognitive perspective. In his development of rational-emotive theory, Ellis (1963) built upon the task-related and task-irrelevant behaviors of Alpert and Haber (1960), and added the component of negative

cognitions. He determined ten kinds of irrational beliefs that he found to be supportive of mood and anxiety disorders, as well as other disorders. Briefly, those belief themes are: demand for approval, high self expectations, blame proneness, frustration reactive, emotional irresponsibility, anxious overconcern, problem avoidance, dependency, helplessness, and perfectionism. These underlying beliefs can interact in any number of ways, and help influence a person's behavior and moods; ultimately, these beliefs and cognitions are a "prime cause of neurosis" (p. 60). However, it is not simply a high level of irrational beliefs in general that can contribute to a disorder or maladaptive thinking; it appears that different patterns of irrational beliefs may be predictive of disordered symptoms (Deffenbacher, Zwemer, Whisman, Hill, & Sloan, 1986). In fact, research has been conducted that connects patterns of irrational beliefs to disorders such as depression, anxiety, PTSD, and even bulimia nervosa (Deffenbacher et al.,1986; Demos, 2001; Muran, & Motta, 1993; Prud'homme & Barron, 1992).

It appears that the specific pattern of irrational belief themes may indicate what disorder a person could experience. One such example is social anxiety disorder, which involves an avoidance of social situations, and is characterized by a pervasive fear of negative social evaluation (Watson & Friend, 1969). Social anxiety was significantly linked to the irrational belief themes of personal perfection, helplessness, and dependency (Deffenbacher et al., 1986). Both social and test anxieties are situation-specific forms of trait anxiety, in contrast to general or trait anxiety which, according to Spielberger et al. (1976), refers to the tendency of a person to evaluate a wide range of situations as dangerous and anxiety-producing. General anxiety was significantly predicted by beliefs of anxious overconcern, personal perfection, catastrophizing, and helplessness (Deffenbacher et al., 1986). As well, it was found that the irrational beliefs of

participants with forms of test, speech, and social anxiety were positively correlated with degree of symptoms (Goldfried & Sobocinski, 1975).

Test anxiety has been linked to several irrational beliefs in particular. Deffenbacher et al. (1986) found that test-anxious subjects significantly endorsed the irrational belief themes of demand for approval, anxious overconcern, and helplessness, a finding that is similar to those of other correlational studies using the Irrational Beliefs Test (Jones, 1968), an inventory based directly upon Ellis' 10 irrational belief themes (Ellis, 1963). The irrational belief of demand for approval refers to the idea that one must be loved and approved of by everyone—an impossible goal, where failure is inevitable (Ellis, 1963; Jones, 1968). When a person takes a high stake in the irrational belief of anxious overconcern, he or she believes that if something dangerous or unpleasant might occur, it is important to be very concerned about it, and to dwell on it in case it does occur. In the irrational belief of helplessness, a person's past is seen as a major determinant in that person's present and future behavior; it often involves a denial of responsibility, as one's behavior is dictated by the past. Someone who scores strongly on the helplessness subscale would believe that it is impossible to change one's ways (Ellis, 1963; Jones, 1968). In summary, when these irrational beliefs are held in combination, a person's cognitive schemas are related to, or even predictive of, his or her test anxiety symptomology.

Irrational Beliefs and Depression

Irrational beliefs, however, are not limited in application to test anxiety alone; as mentioned above, research has been conducted using irrational beliefs as a cognitive basis for other disorders, such as depression. From the 1960s on, Aaron Beck was one of the forerunners of the cognitive psychology movement as it affected research and treatment of depression. In his early research, Beck found that many of his depressed patients showed evidence of negative

cognitions; however, they did not seem to be aware of the negativity of their thoughts (Beck, 1991). Based on these negative cognitions, Beck formulated a theory of depression that argued that the cognitions of depressed patients fall into three categories: negative perceptions and expectations about themselves, the world, and the future (Beck, Rush, Shaw, & Emery, 1979). He later found that these negative cognitions were not only present in depressed patients, but were also common among patients with schizophrenia and anxiety disorders. Both Beck and Ellis (1963) attempted to categorize the content of negative cognitions; in fact, Ellis' and Beck's themes are rather similar.

Interestingly, the negative cognitions of depression and test anxiety have been found to be similar in content, such as thoughts of helplessness (Swendsen, 1997). It would appear that depression and test anxiety have some similar cognitive facets; in fact, the two appear to be highly correlated in many populations (Burns & Eidelson, 1998; Rivas-Vazquez, Saffa-Biller, Ruiz, Blais, & Rivas-Vazquez, 2004). Prud'homme and Barron (1992) found that subjects with a diagnosis of major depressive disorder (MDD) held a pattern of beliefs similar to those in test-anxious students: demand for approval, helplessness, and anxious overconcern. In addition, however, MDD patients showed significant beliefs in the theme of frustration reactivity. The belief of frustration reactivity is grounded in the idea that when things go wrong, or are not the way one wishes them to be, it is awful and disastrous (Ellis, 1963; Jones, 1968); frustration reactivity is sometimes referred to as "catastrophizing" (Deffenbacher et al., 1986).

The present study aims to examine patterns of irrational beliefs in one population of test-anxious and depressive students, and to study how an individual high in both test anxiety and depressive symptoms may differ in irrational beliefs from a subject high in test anxiety only. First, this study focuses on irrational beliefs in test-anxious students, in particular the degree of

irrational beliefs found across differential levels of test anxiety. I expect that the levels of irrational beliefs held will be positively correlated with level of test anxiety. Specifically, the irrational beliefs to be investigated will be anxious overconcern, helplessness, and demand for approval. It is believed that these three irrational belief themes will be significant predictors of test anxiety score; as a participant's score on each of the irrational beliefs increases, so will his or her score on the test anxiety inventory.

The second aim of this study is to examine patterns of irrational beliefs in students with symptoms of both test anxiety and depression. I hypothesize that students who show high amounts of test anxiety and depression will have a different pattern of irrational beliefs than students with equal amounts of test anxiety, but with low or insignificant amounts of depressive symptoms. Specifically, both groups will show belief in the irrational cognitions of anxious overconcern, helplessness, and demand for approval. Additionally, however, high test-anxious, high-depression students will also show beliefs in the category of frustration reactivity.

Method

Participants

A total of 135 students participated in this study. One hundred thirty-three male (n = 54) and female (n = 89) participants were students enrolled in the General Psychology class, who signed up for the study to fulfill part of a course requirement. One male student was recruited after attending a school-sponsored study skills workshop. One female participant was an undergraduate student from Germanna Community College, who, during a previous test anxiety study, had indicated interest in participating in future test anxiety research. The mean age of participants was 19.44 (SD = 2.87). The participants were relatively representative of the Mary Washington student body, with 85.9% of students identifying themselves as Caucasian (n = 116).

All participants completed an informed consent form and were debriefed after the study, in accordance with American Psychological Association ethical guidelines.

Procedure

Due to time constraints, participants recruited after the study skills workshop were given paper surveys; however, all other participants completed an identical online survey. Participants who completed the survey as part of the General Psychology course requirements signed up using the school's online experiment sign-up page. Participants from Germanna Community College were e-mailed using the contact information they had provided, and invited to take the survey online as well. E-mail addresses were logged at the online survey site for General Psychology students to ensure they received course credit, but participants' names were not connected to their data.

Participants completed self-report measures of test anxiety, depressive symptoms, and irrational beliefs, and answered demographic questions (see Table 1 for descriptive statistics on relevant scales).

Measures

Irrational Beliefs. To examine participants' irrational beliefs, the Irrational Beliefs Test (IBT; Jones, 1968) was used. The IBT is a 100-item self-report questionnaire that examines Ellis' 10 irrational belief themes. Briefly, those belief themes are demand for approval, high self expectations, blame proneness, frustration reactive, emotional irresponsibility, anxious overconcern, problem avoidance, dependency, helplessness, and perfectionism. The IBT asks participants to rate how much they agree with statements such as "It is important to me that others approve of me" on a scale of one to five, one being "strongly disagree," and five being

"strongly agree." Each of the 100 items corresponds to one of the ten irrational belief themes; participants receive a score on each theme subscale ranging from 10 (very low) to 50 (very high).

Test Anxiety. The Test Anxiety Scale (TAS), developed by Sarason (1978), is a 37-item self-report measure used to examine levels of test anxiety. Each item is a statement that the participant rates as true or false, such as "While taking an important examination I perspire a great deal." Scores range from 0 to 37. Participants with scores falling between 0 and 18 are considered to be low test-anxious; scores from 19 to 37 indicate a high level of test anxiety. The TAS is a commonly used inventory of test anxiety, with test-retest reliabilities in the .80s (Sarason, 1980).

Depression. The Center for Epidemiological Studies Depression Scale (CES-D) was developed by Radloff (1977) as a short, self-report inventory of depressive symptoms. The scale consists of 20 statements, such as "I was bothered by things that usually don't bother me;" participants rate each statement by indicating how many days, in the past week, they have felt that way. For example, a rating of 0 indicates that the participant felt that way "rarely or some of the time, less than 1 day;" a rating of 3, the highest, indicates the participant felt that way "all of the time, 5-7 days." A score between 0 and 15 indicates a low amount of depressive symptoms; a score between 15 and 21 indicates a moderate amount, and a score above 21 suggests a potential diagnosis of depressive disorder. It is important to note that the CES-D scale is designed to be highly sensitive to depressive symptoms.

Results

An initial bivariate correlation was run to examine the intercorrelations between test anxiety scores and all irrational belief subscales. Test anxiety score was found to be significantly correlated ($p < .01$) with demand for approval, high self expectancy, frustration reactivity,

emotional irresponsibility, anxious overconcern, problem avoidance, and helplessness. A stepwise regression was then conducted to examine to what extent the irrational belief subscales were significant predictors of test anxiety score. The first model included the variables from hypothesis 1: demand for approval, anxious overconcern, and helplessness. The second model included the other variables that were found to be significantly correlated with test anxiety scores (see Table 2 for intercorrelational data). It was found that demand for approval and anxious overconcern were significant predictors of test anxiety scores, $p < .05$, but that helplessness was not a significant predictor, $p = .068$ (see Table 3 for regression data). The three subscales in model 1 also explained a significant proportion of the variance in test anxiety scores, $R^2 = .26$, $F(3, 114) = 12.21$, $p < .001$. Only one of the variables in model 2 (which included all correlated variables) was a significant predictor of test anxiety score: problem avoidance, $p = .035$. However, model 2 explained only an additional 3.6% of the variance in test anxiety scores ($R^2 = .30$).

Second, an Independent Samples t-test was run to examine how high test-anxious, low-depression participants differed in their irrational beliefs from high test-anxious, high-depression participants (see Table 4 for means and standard deviations). Because of the highly sensitive nature of the CES-D, and also because the range of "moderate" depression scores is so narrow, all scores falling between 0 and 21 were considered indicative of low amounts of depressive symptoms. Consistent with the original parameters of the scale, scores over 21 were considered high. As expected, there were no significant differences for demand for approval, $t(63) = -1.63$, $p > .05$; anxious overconcern, $t(65) = -1.85$, $p > .05$; or for helplessness, $t(65) = -1.40$, $p > .05$. Contrary to the second hypothesis, however, there were also no significant differences for the irrational belief of frustration reactivity, $t(61) = -0.928$, $p > .05$. Effect sizes for demand for

approval and frustration reactivity were moderate (Cohen's *d* = .55 and .59, respectively), while effect sizes for anxious overconcern and helplessness were small (Cohen's *d* = .18 for both). In addition, a power analysis for the test, using the program G*Power, estimated power at .95.

Discussion

The first aim of this study was to examine patterns of irrational beliefs important to the etiology of test anxiety. Based on the analysis, this hypothesis was partially supported: both irrational belief themes of demand for approval and anxious overconcern were significant predictors of scores on the TAS. However, it was found that the belief theme of helplessness was not a significant predictor of test anxiety score; as well, the theme of problem avoidance was found to be a significant predictor. This second finding is inconsistent with previous research (Deffenbacher et al., 1986; Goldfried & Sobocinski, 1975), which found that problem avoidance was not significantly correlated with test anxiety.

The second hypothesis posited that students with high test anxiety and low depression would differ from students with high test anxiety and high depression on the irrational belief theme of frustration reactivity. Specifically, it was believed that depressive symptoms would be highly correlated with frustration reactivity. However, the two groups were found to show similar scores on all four subscales, and no significant differences were observed. Again, this finding is inconsistent with previous studies (Deffenbacher et al., 1986; Prud'homme & Barron, 1992), which found that patients with test anxiety scored significantly higher on the IBT subscales of demand for approval, helplessness, and anxious overconcern, whereas patients with MDD additionally scored higher on the subscale of frustration reactivity.

These findings bring to light several important implications for future research on irrational beliefs. First, that unaccounted-for comorbid disorders should be investigated when

attempting to determine patterns of irrational beliefs. The current study did not take into account students' mental disorders other than depression and test anxiety; it is possible that the presence of comorbid disorders could have affected the irrational belief subscale scores. In the study by Deffenbacher et al., (1986), the irrational belief of problem avoidance was significantly endorsed by participants with trait anxiety. It could be that general trait anxiety may be linked to test anxiety; in future research, administration of a trait anxiety scale may help differentiate participants who possess trait anxiety from those who are test anxious. The findings do suggest, however, that demand for approval and anxious overconcern do play a role in the development and maintenance of test anxious symptoms. These findings have implications for the cognitive or cognitive-behavioral treatment of test anxiety, particularly in college populations.

This study, though imperfect, did yield several important results that should be taken into account in future research, as well as treatment. First, test anxiety and irrational beliefs do appear to be significantly correlated in a positive direction; as well, the experience of anxiety in evaluative situations does seem to be linked to several specific irrational belief themes. Therefore, in cognitive treatment, it may be beneficial to focus first on those irrational belief themes. Second, these results highlight the importance of a comprehensive evaluation of possible comorbid disorders; the presence of these disorders may affect not only the number and content of irrational belief themes, but also the extent to which a person endorses them. This research adds to the growing body of literature on the relationship between irrational beliefs and psychological disorders, and provides additional evidence that the content of one's irrational beliefs may relate to or determine disordered symptomology.

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Table 1

Means (SD) for Test Anxiety, Depression, and Irrational Beliefs Test Subscales

	Mean (SD) *N*
Test anxiety	19.02 (8.01) *n* = 125
Depression	17.98 (10.60) *n* = 125
Demand for approval	28.43 (5.63) *n* = 130
Anxious overconcern	32.65 (6.33) *n* = 132
Helplessness	27.89 (5.77) *n* = 133
Frustration reactivity	29.85 (5.30) *n* = 131
Problem avoidance	31.23 (5.40) *n* = 129

Table 2

Intercorrelations Between Test Anxiety and Irrational Belief Test Subscales

	Demand for approval	High self expectancy	Blame proneness	Frustration reaction	Emotional irresponsibility	Anxious overconcern	Problem avoidance	Dependency	Helplessness	Perfectionism
Test anxiety score	.40**	.39**	-.02	.28**	.29**	.44**	.32**	.16	.35**	-.05
Demand for approval		.43**	.03	.42**	.30**	.49**	.33**	.21*	.30**	-.07
High self expectancy			.12	.41**	.17	.60**	.12	.16	.38**	.01
Blame proneness				.17	.07	-.03	-.10	.10	.01	.05
Frustration reaction					.45**	.50**	.06	.17	.46**	-.04
Emotional irresponsibility						.36**	.16	-.01	.47**	.30**
Anxious overconcern							.21*	.27**	.36**	-.05
Problem avoidance								.00	.25**	-.18*
Dependency									.05	.15
Helplessness										-.03

*$p < .05$. **$p < .01$.

Table 3

Summary of Stepwise Regression Analysis for Variables Predicting High Test Anxiety (*N* = 118)

	Variable	*B*	*SE B*	*β*
Model 1	Demand for approval	.30	.14	.21*
	Anxious overconcern	.34	.13	.26*
	Helplessness	.24	.13	.19
Model 2	Demand for approval	.21	.15	.14
	Anxious overconcern	.24	.15	.19
	Helplessness	.13	.15	.09
	High self expectations	.13	.19	.08
	Frustration reactivity	.07	.17	.04
	Emotional irresponsibility	.07	.16	.04
	Problem avoidance	.3	.14	.20*

*p < .05.

Table 4

Means (SD) for Depression and Irrational Beliefs Subscales

	High Test Anxiety, High Depression	High Test Anxiety, Low Depression
Demand for approval	31.52 (5.57) *n* = 31	29.29 (5.41) *n* = 34
Anxious overconcern	35.79 (5.05) *n* = 33	33.24 (6.19) *n* = 34
Helplessness	30.03 (5.90) *n* = 33	28.09 (5.45) *n* = 34
Frustration reactance	31.73 (5.58) *n* = 30	30.55 (4.57) *n* = 33

Note. Scores are based on participants' responses on IBT, with a minimum score of 10 and a maximum score of 50.